Name of Organization: Ducks Unlimited, Inc.

Type of Organization: Other

Contact Information: Dr. Tina Yerkes

Ducks Unlimited, Great Lakes / Atlantic Regional Office

331 Metty Dr. Suite 4

Ann Arbor MI 48103

Phone: (901) 758 - 3755 **Extension:**

Fax: (901) 758 - 3850

E-Mail: tyerkes@ducks.org

Project Title: Potential Mercury Reduction in Lake Erie Piscivorous Birds

Project Category: Pollution Prevention and Reduction - BNS

Rank by Organization (if applicable): 0

Total Funding Requested ($): 82,206 **Project Duration:** 1.5 Years

Abstract:

The overriding goal of the Great Lakes Binational Toxics Strategy is the virtual elimination of persistent toxic substances, particularly those which bioaccumulate such as mercury. Under this initiative, several agreements exist to reduce mercury discharge into the Great Lakes ecosystem. In 1972-1973, Hoffman and Curnow documented mercury levels in Lake Erie piscivorous birds: herson and egrets. We propose to build upon this baseline documentation of mercury tissue loads and evaluate the potential reduction of mercury in the environment. Mercury levels found in liver and muscle tissue will serve as indicators of our progress toward elimination or reduction of this persistent bioaccumulative toxic substance, thus allowing an assessemnt of the Binational Toxics Strategy goals. Since reduction of mercury has occured after 1988, we should see a reduction in tissue mercury levels of herons and egrets because they represent a terminal trophic level of the Lake Erie aquatic ecosystem.

Geographic Areas Affected by the Project

States:

- ☐ Illinois
- ☐ Indiana
- ☐ Michigan
- ☐ Minnesota
- ☐ New York
- ☐ Pennsylvania
- ☐ Wisconsin
- ☒ Ohio

Lakes:

- ☐ Superior
- ☐ Huron
- ☐ Michigan
- ☒ Erie
- ☐ Ontario
- ☐ All Lakes

Geographic Initiatives:

☐ Greater Chicago ☐ NE Ohio ☐ NW Indiana ☐ SE Michigan ☐ Lake St. Clair

Primary Affected Area of Concern:

Other Affected Areas of Concern:

For Habitat Projects Only:

Primary Affected Biodiversity Investment Area: Not Applicable

Other Affected Biodiversity Investment Areas:

Problem Statement:

Mercury is a persistent, bioaccumulative toxic chemical substance that poses unreasonable risk to human health and the health of the environment. There has been a long history of mercury release into the environment, particularly in the Great Lakes Ecosystem. Its release in this area was correlated with increased industrialization. Being recognized as a major heath and environmental problem, mercury elimination was identified as a level 1 priority by the Great Lakes Binational Toxic Strategy: a comprehensive, binational program to lessen uses and exposure to persistent toxic chemicals. By 2006 in the United States, the strategy challenged a reduction of 50% of the deliberate release of mercury and a 50% reduction resulting from human activity, although industrial reductions and others have occured since 1988.

In the Western basin of Lake Erie, industry was the largest contributor of mercury to the lake ecosystem. Studies conducted by Hoffman and Curnow (1973, 1979, 1980) were designed to gain insight into the environmental mercury problem and to understand the significance of the mercury concentration factor in fresh water marsh ecosystems. They assessed total mercury concentrations in various tissues of piscivorous birds because these birds represent a trophic level endpoint for bioaccumulation of mercury in an aquatic ecosystem. They found elevated mercury levels, particularly in adult birds and those that fed on fish offshore. All liver tissue mercury levels were greater than the 0.5 ppm tolerance level established by the Food and Drug Administration. We propose to build upon this previous baseline work, document current mercury levels in piscivorous fish, and to compare previous mercury levels to present levels to evaluate the potential reduction of mercury in the Western basin of Lake Erie.

Proposed Work Outcome:

The proposed project methods will mirror those of Hoffman and Curnow (1973, 1979) to ensure direct comparability. We will collect Great Blue Herons, Black-crowned Night Herons, and American Egrets from West Sister Island (14.5 km north of Ottawa NWR, OH) and from a 2.4 ha woodlot located at Winous Point Marsh Conservancy, the exact locations of previous collections. We will restrict our analysis of mercury levels to liver and breast tissue in adults (100 total) and one egg of a clutch because these tissues were found to be the most biologically relevant for comparisons. Mercury tissue concentrations will be analyzed via standard procedures at KAR Laboratories, Kalamazoo MI.

The outcome of this project will be documentation of current mercury levels in piscivorous fish in Lake Erie. More importantly, this project will allow a direct comparion between the bioaccumulated mercury tissue levels that existed in 1972-1973 and those levels that currently exist today. This will allow an evaluation of the reduction challenge goals set forth by the Binational Toxics Strategy. All results will be made public and publised in peer-review scientific journals.

Project Milestones:	Dates:
Research Committee established	01/2000
Research project finalized	05/2000
Permit acquisition, field staff	03/2001
bird collections	05/2001
tissue analysis	06/2001
analysis/comparison of results	07/2001
publication/dissemination of results	08/2001
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☐ Project Addresses Environmental Justice

If So, Description of How:

☒ Project Addresses Education/Outreach

If So, Description of How:

All results of this study will be publised in peer-review journals of scientific interest and will be presented at a conference to insure dissemination of the findings

Project Budget:

	Federal Share Requested ($)	Applicant's Share ($)
Personnel:	21,600	9,200
Fringe:	2,256	3,840
Travel:	8,100	0
Equipment:	0	2,000
Supplies:	250	250
Contracts:	50,000	0
Construction:	0	0
Other:	0	5,000
Total Direct Costs:	82,206	20,290
Indirect Costs:	0	0
Total:	82,206	20,290
Projected Income:	0	0

Funding by Other Organizations (Names, Amounts, Description of Commitments):

We are not currently aware of any availabe sources for additional funding for this project.

The applicants share represent in-kind contributions from both the Institute for Wetland and Waterfowl Research, DU Memphis TN, and from the Great Lakes Regional Office, Ann Arbor MI. Du will also provide additional staff time, as needed, beyond the salary amount designated in the above budget

"Othe"r funding in the above budget will be donated by Winous Point Marsh Conservancy and will consist of $500 in kind contribution for lodging and laboratory space and an additional $4500 for sample analysis.

Description of Collaboration/Community Based Support:

This project is a collaborative effort between Dr. Robert Hoffman, Ducks Unliminted Great Lakes / Atlantic Regional Office, and Dr. Tina Yerkes, Ducks Unlimited National Headquarters. Dr. Hoffman conducted the original research on mercury levels in piscivorous birds in Lake Erie.

Winous Point Marsh Conservancy, Port Clinton Ohio, will provide lodging and laboratory space.